

REMARKS

Claims 25, 26, 29-31, 33, 34 and 37-39 are pending, with claims 29 and 37 being independent. Claims 26 and 34 have been cancelled without prejudice. Claims 29 and 37 have been amended. New claims 41-50 have been added, with claim 45 being independent. No new matter has been added. Reconsideration and allowance of the above-referenced application are respectfully requested.

Rejections Under 35 U.S.C. §103

Claims 25-26, 29-31, 33-34 and 37-39 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Sawhney, H. E., et al., "Video Flashlights – Real Time Rendering of Multiple Videos for Immersive Model Visualization" (hereinafter "Sawhney"). This contention is respectfully traversed.

Independent claim 29 has been amended to remove the final two wherein clauses, which have now been placed in new claims 41 and 42. Claim 29 has also been amended to include language from cancelled claim 26, excluding the limitation that the surface be a two dimensional surface. Support for this amendment can be found in the application: "The surface 1660 can be a two dimensional surface or a three dimensional surface."¹ Similar changes have also been made with respect to claims 34, 37, 43 and 44.

The Office asserts that Sawhney teaches "placing a surface that corresponds to the moving region in the three dimensional model" and "projecting the real-time video imagery information onto the three dimensional model, including the surface, based on the position and

¹ See Specification at Paragraph 102, beginning at page 40, line 3.

orientation information”, stating “fig. 10 illustrates moving objects”.² However, Figure 10 in Sawhney shows moving object detection, not placing a surface that corresponds to the moving region in the three dimensional model and projecting real-time video imagery information onto the three dimensional model, including the surface.³ To the contrary, moving objects are represented in the three dimensional model using “blobs or icons.”⁴ Sawhney does state that three dimensional models of the moving object can be “rendered along with the site model”⁵, but does not state that the video information is projected onto such models.

Nonetheless, in order to clearly distinguish over Sawhney, claim 29 has been amended to recite, “wherein placing the surface comprises casting a ray from an optical center, corresponding to the real-time video imagery information, to a bottom point of the moving region in an image plane in the three dimensional model, and determining a position, an orientation and a size of the surface based on the ray, a ground plane in the three dimensional model, and the moving region.”⁶ In the rejection of cancelled claim 26, the Office states, “Examiner's note: casting rays are: cast and traced in groups based on some geometric constraints, and each ray is traced separately, so that every point (usually a pixel) on the display is traced by one ray.”⁷ However, it should be noted that the ray casting claimed relates to casting a vector in the three dimensional model⁸ and does not refer to generating pixels on a display. The Office also refers to Figures 5 and 6 of Sawhney, but these portions of Sawhney do not

² See 11-13-2007 Office Action at page 3.

³ See Sawhney at Figure 10 and section 5, at pages 164, 165 and 167.

⁴ See Sawhney at Figures 11 and 12, and section 5, at pages 165, 167 and 168.

⁵ See Sawhney at section 2, page 158.

⁶ See e.g., Specification at paragraphs 101-106.

⁷ See 11-13-2007 Office Action at page 5.

⁸ See e.g., Specification at paragraph 104.

relate to, or describe, placing a surface that corresponds to a moving region in a three dimensional model.

Furthermore, with respect to “determining a position, an orientation and a size of the surface based on the ray, a ground plane in the three dimensional model, and the moving region”, the Office states, “in fig. 10 illustrates a 3D model, and a moving region.”⁹ With all due respect to the Office, nothing Figure 10 or its corresponding description says anything about determining a position, an orientation and a size of a surface that is placed in a three dimensional model, let alone “casting a ray from an optical center, corresponding to the real-time video imagery information, to a bottom point of the moving region in an image plane in the three dimensional model.” In fact, the only technique described in Sawhney for modeling a moving object is to use “stereo depth information” from “stereo cameras.”¹⁰ This is in sharp contrast with the presently claimed techniques, which can be employed using only a single camera.¹¹ Thus, Sawhney fails to teach or suggest “placing a surface that corresponds to the moving region in the three dimensional model, wherein placing the surface comprises casting a ray from an optical center, corresponding to the real-time video imagery information, to a bottom point of the moving region in an image plane in the three dimensional model, and determining a position, an orientation and a size of the surface based on the ray, a ground plane in the three dimensional model, and the moving region.”

⁹ See 11-13-2007 Office Action at page 5.

¹⁰ See Sawhney at sections 2 and 5, at pages 158 and 165.

¹¹ See e.g., Specification at FIG. 16 and corresponding description.

In addition, it is noted that similar subject matter was rejected previously based on US Pat. Pub. 2003/0085992 (Arpa).¹² However, Arpa does not state that the “sphere based model of a person” has real-time video imagery information projected onto it, but rather indicates that the rendered view 702 of the model is simply an iconic representation.¹³ Furthermore, Arpa does not teach or suggest “placing a surface that corresponds to the moving region in the three dimensional model, wherein placing the surface comprises casting a ray from an optical center, corresponding to the real-time video imagery information, to a bottom point of the moving region in an image plane in the three dimensional model, and determining a position, an orientation and a size of the surface based on the ray, a ground plane in the three dimensional model, and the moving region.”

Thus, independent claim 29 should be in condition for allowance. Similar arguments are applicable to claims 37 and 45, and thus, independent claims 37 and 45 should each be in condition for allowance. Dependent claims 25, 30, 31, 33, 38, 39, 41-44 and 46-50 should be patentable based on their respective base claims and the additional recitations they contain.

For example, claims 41, 43 and 49 each recite, “wherein identifying a foreground object comprises identifying the foreground object in the subtracted real-time video imagery information using a histogram-based threshold and a noise filter.” The cited portion of Sawhney clearly describes the use of a threshold applied to a difference image between a current image and a median of a stack of images.¹⁴ Sawhney does not indicate that the threshold is histogram-based or that a noise filter is used. Furthermore, the Office’s interpretation that “a noise filter”

¹² See 5-4-2005 Office Action at page 19.

¹³ See Arpa at paragraphs 46 and 47.

¹⁴ See Sawhney at Figure 10 and section 5, at page 164 and 167.

may be considered “as a virtual camera view in fig. 3”¹⁵ is not understood and is without rational basis. Thus, claims 41, 43 and 49 should be patentable for these additional reasons.

Claims 42, 44 and 50 each recite, “wherein identifying a region in motion in real time further comprises estimating the background image by modeling the background image as a temporal pixel average of five recent image frames in the real-time video imagery information.” With respect to this subject matter, the Office “takes an official notice for an average of five recent frames, because Sawhney on page 161 under 'A pseudo-code for the rendering algorithm ..' teaches as one of the parameters that a user may be indicated a number for number of frames ‘frame number’, and that number may be 5 image frames.”¹⁶ This official notice is explicitly challenged and a supporting reference is requested. Moreover, the “Frame Number” is a parameter to the “UpdateVideoContent” procedure, which clearly relates to retrieving the most recent available video data from a camera specified by “Video Source”. Contrary to the Office’s assertion, nothing in Sawhney suggests that this procedure is part of the process of moving object detection or that the “Frame Number” may be an indication to use five recent image frames to generate a temporal pixel average to model the background image. Furthermore, taking official notice regarding this claimed subject matter is inappropriate since the Office has previously contended that “applicant has established criticality for the use of five frames in the averaging technique” and “optimizing such a number of frames would require undue experimentation under *In re Wands*, since applicant points out that five frames has a specific benefit, as per the specification.”¹⁷ Thus, claims 42, 44 and 50 should be patentable for these additional reasons.

¹⁵ See 11-13-2007 Office Action at page 4.

¹⁶ See 11-13-2007 Office Action at page 4.

¹⁷ See 11-28-2005 Office Action at page 6.

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Conclusion

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific issue or comment does not signify agreement with or concession of that issue or comment. Because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper.

It is respectfully suggested for all of these reasons, that the current rejections are overcome, that none of the cited art teaches or suggests the features which are claimed, and therefore that all of these claims should be in condition for allowance. A formal notice of allowance is thus respectfully requested. In the absence of such, a telephone interview is requested to review the claims and the cited art.

Please apply the one month extension of time fee, and any other necessary charges or credits, to deposit account 06-1050.

Respectfully submitted,

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